

Claims

- [c1] 1. A method for fabricating a piezoelectric workpiece for an electric circuit in a piezoelectric system, said method comprising the steps of:
- a) forming a plurality of function electrodes on the surface of the body of said workpiece, said plurality of function electrodes being connected in said electric circuit of said piezoelectric system; at least one of said function electrodes having a shape with a contour of at least one acute angle;
 - b) forming at least one polarization augmenting electrode on the surface of said body proximate to said acute angle, said polarization augmenting electrode and said proximate function electrode thereof constituting a gross electrode when connected electrically together; and
 - c) polarizing electric dipoles of grain molecules of said body utilizing said gross electrode, said gross electrode substantially canceling said acute angle when paired with one of said function electrodes and connected to a polarization voltage for implementing said polarization; and said polarization voltage polarizing electric dipoles of grain molecules of said body in between said pair so

that the boundary region between different polarization orientation distribution regions within said piezoelectric workpiece is smoothed without any acute angle.

- [c2] 2. The fabricating method of claim 1 wherein said at least one polarization augmenting electrode has a shape that is substantially elongated.
- [c3] 3. The fabricating method of claim 1 wherein said at least one polarization augmenting electrode of substantially elongated shape has at least one smooth edge opposite to said acute angle of said proximate function electrode.
- [c4] 4. The fabricating method of claim 1 wherein said at least one polarization augmenting electrode has a shape that is substantially a closed-loop ring surrounding said proximate function electrode.
- [c5] 5. The fabricating method of claim 1 wherein said at least one polarization augmenting electrode of substantially closed-loop ring has at least one smooth edge opposite to said acute angle of said proximate function electrode.
- [c6] 6. A method for fabricating a piezoelectric workpiece for electrically connected in an electric circuit for energy conversion between electrical and mechanical forms in a

piezoelectric system, said method comprising the steps of:

- a) forming a body of piezoelectricity for implementing said energy conversion; and
- b) forming a plurality of function electrodes on the surface of said body, said plurality of function electrodes being connected in said electric circuit for implementing said energy conversion; at least one of said function electrodes having a shape with a contour of at least one acute angle;
- c) forming at least one polarization augmenting electrode on the surface of said body proximate to said acute angle, said polarization augmenting electrode and said proximate function electrode thereof constituting a gross electrode when connected electrically together; and
- d) polarizing electric dipoles of grain molecules of said body utilizing said gross electrode, said gross electrode substantially canceling said acute angle when paired with one of said function electrodes and connected to a polarization voltage for implementing said polarization; and said polarization voltage polarizing electric dipoles of grain molecules of said body in between said pair so that the boundary region between different polarization orientation distribution regions within said piezoelectric workpiece is smoothed without any acute angle.

- [c7] 7. The fabricating method of claim 6 wherein said at least one polarization augmenting electrode has a shape that is substantially elongated.
- [c8] 8. The fabricating method of claim 7 wherein said at least one polarization augmenting electrode of substantially elongated shape has at least one smooth edge opposite to said acute angle of said proximate function electrode.
- [c9] 9. The fabricating method of claim 6 wherein said at least one polarization augmenting electrode has a shape that is substantially a closed-loop ring surrounding said proximate function electrode.
- [c10] 10. The fabricating method of claim 9 wherein said at least one polarization augmenting electrode of substantially closed-loop ring has at least one smooth edge opposite to said acute angle of said proximate function electrode.
- [c11] 11. A method for fabricating a piezoelectric workpiece for electrically connected in an electric circuit for energy conversion between electrical and mechanical forms in a piezoelectric system, said method comprising the steps of:
- a) forming a body of piezoelectricity for implementing

said energy conversion; and

b) forming a plurality of function electrodes on the surface of said body, said plurality of function electrodes being connected in said electric circuit for implementing said energy conversion; at least one of said function electrodes having a shape with a contour of at least one acute angle; and

c) polarizing electric dipoles of grain molecules of said body utilizing at least a polarization augmenting electrode pressed onto the surface of said body proximate to said acute angle; wherein

said polarization augmenting electrode and said proximate function electrode thereof constituting a gross electrode when connected electrically together, said gross electrode substantially canceling said acute angle when paired with one of said function electrodes and connected to a polarization voltage for implementing said polarization; and

said polarization voltage polarizing electric dipoles of grain molecules of said body in between said pair so that the boundary region between different polarization orientation distribution regions within said piezoelectric workpiece is smoothed without any acute angle.

[c12] 12. The fabricating method of claim 11 wherein said at least one polarization augmenting electrode has a shape

that is substantially elongated.

[c13] 13. The fabricating method of claim 12 wherein said at least one polarization augmenting electrode of substantially elongated shape has at least one smooth edge opposite to said acute angle of said proximate function electrode.

[c14] 14. The fabricating method of claim 11 wherein said at least one polarization augmenting electrode has a shape that is substantially a closed-loop ring surrounding said proximate function electrode.

[c15] 15. The fabricating method of claim 14 wherein said at least one polarization augmenting electrode of substantially closed-loop ring has at least one smooth edge opposite to said acute angle of said proximate function electrode.

[c16] 16. The fabricating method of claim 11 wherein said at least one polarization augmenting electrode is pressed onto the surface of said body only during said fabrication and is removed after said fabrication.